

REMARKS

Claims 13-19 are pending in this application, of which claims 13, 14 and 16 have been amended. No new claims have been added.

The Examiner has objected to claims 14 and 16 for various informalities have been corrected in the aforementioned amendments.

The Examiner has rejected the claims as follows:

- ① Claim 13 under 35 USC §102(e) as anticipated by U.S. Patent 6,313,539 to Yokoyama et al. (hereinafter "Yokoyama et al.");
- ② Claim 17 under 35 USC §103(a) as unpatentable over Yokoyama et al. in view of U.S. Patent 6,376,325 to Koo (hereinafter "Koo"); and
- ③ Claim 19 under 35 USC §103(a) as unpatentable over Yokoyama et al..

Applicants respectfully traverse these rejections.

Yokoyama et al. discloses a semiconductor memory device including a capacitor formed on a substrate and including a lower electrode, a dielectric film and an upper electrode; a selection transistor formed at the substrate; an electrically conductive plug for providing electrical connection between the selection transistor and the capacitor; and a diffusion barrier film provided between the electrically conductive plug and the lower electrode of the capacitor.

The diffusion barrier film 516 in Fig. 21(c) is a $Ta_xSi_{1-x}N_y$ film. The lower electrode includes an Ir film 517 and an IrO_2 film 518 which are sequentially formed.

Koo has been cited for teaching forming the lower electrode comprising an iridium layer 118a (Fig. 3A), and an iridium oxide layer 122 (Fig. 3B).

Neither Yokoyama et al. nor Koo discloses, for the lower electrode of the capacitor, a sequential arrangement of a first conductive layer containing a first metal, a second conductive layer made of metal oxide of second metal except iridium or ruthenium different from the first metal, and a third conductive layer made of third metal except iridium or ruthenium different from the first metal.

The Examiner has admitted that Fig. 21C of Yokoyama et al. discloses that the “interface conductive layer 517 [is] made of the second metal (Ir) ...”, where the lower electrode is sequentially composed of a TaSiN layer (516), an Ir layer (517), and IrO₂ layer (518), and a Pt layer (519).

Accordingly, claim 13 has been amended to recite this distinction. In amended claim 13, by employing such structure as the lower electrode of the capacitor, the diffusion of oxygen into the conductive plug formed immediately under the lower electrode in the step of the layer formation of the capacitor dielectric layer can be prevented by the first conductive layer (a first metal: ir, Ru, Ir oxide, Ru oxide, etc.). Also the diffusion of the first metal from the first conductive layer to the capacitor dielectric layer can be prevented by the second conductive layer (oxide of a metal (Pt, Pd or Os etc.) except Ir or Ru).

Thus, all prior art rejections should be withdrawn.

U.S. Patent Application Serial No. 10/764,519
Response to Office Action dated October 15, 2004

In view of the aforementioned amendments and accompanying remarks, claims 13-19, as amended, are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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PATENT TRADEMARK OFFICE

Enclosures: Substitute Abstract of the Disclosure
 Petition for Extension of Time

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